



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/713,219	11/17/2003	Shinji Maekawa	740756-2670	2735

22204 7590 07/26/2007  
NIXON PEABODY, LLP  
401 9TH STREET, NW  
SUITE 900  
WASHINGTON, DC 20004-2128

EXAMINER
----------

SCHILLINGER, LAURA M

ART UNIT	PAPER NUMBER
----------	--------------

2813

MAIL DATE	DELIVERY MODE
-----------	---------------

07/26/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

Application No.

10/713,219

Applicant(s)

MAEKAWA ET AL.

Examiner

Laura M. Schillinger

Art Unit

2813

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 03 July 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-7,9 and 11-44 is/are pending in the application.
- 4a) Of the above claim(s) 2,4-7,9,11-17,19,21-26,28,30-35,37 and 39-44 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3,18,20,27,29,36 and 38 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>7/3/07</u> . | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3, 18, 20, 27, 29, 36, 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ichijo et al (6821828).

Ichijo teaches the following claimed limitations as cited below:

1. A method for fabricating a thin film transistor, comprising:  
forming a first amorphous semiconductor film (Col.8, lines: 55-65);  
forming a material including a metal element to promote crystallization over the first amorphous semiconductor film (Col.9, lines: 15-35);  
heating the first amorphous semiconductor film to form a first crystalline semiconductor film (Col.9, lines: 35-65);  
forming a second amorphous semiconductor film by sputtering over the first crystalline semiconductor film (Col.10, lines: 50-55; Col.8, lines: 65);  
heating the first crystalline semiconductor film and the second amorphous semiconductor film (Col.11, lines: 10-30);  
removing the second amorphous semiconductor film (Col.12, lines: 5-10) and

Art Unit: 2813

wherein the second semiconductor film serves as a gettering sink (Col.10, lines: 50-55)

wherein the second amorphous semiconductor film contains nitrogen at a concentration of  $1 \times 10^{18}$  atoms/cm or lower (Col.16, lines: 35), oxygen concentration is  $8 \times 10^{19}$  or lower (Col.16, line:35-37), and a noble gas concentration is  $1 \times 10^{20}$  atoms/cm<sup>3</sup> or higher (Col.10, line:65).

3. A method for fabricating a thin film transistor, comprising:

forming a first amorphous semiconductor film (Col.13,lines:25-30);

forming a material including a metal element to promote crystallization over the first amorphous semiconductor film (Col.13,lines: 40-50);

forming a second amorphous semiconductor film by sputtering over the first amorphous semiconductor film (Col.13, lines: 25-30; Col.8, liens: 65);

heating the first amorphous semiconductor film and the second amorphous semiconductor film (Col.14, lines: 1-5 and Col.11, lines: 10-30);

removing the second amorphous semiconductor film (Col.12, lines: 5-10) and

wherein the second semiconductor film serves as a gettering sink (Col.10, lines: 50-55)

wherein the second amorphous semiconductor film contains nitrogen at a concentration of  $1 \times 10^{18}$  atoms/cm or lower (Col.16, lines: 35), oxygen concentration is  $8 \times 10^{19}$  or lower (Col.16, line:35-37), and a noble gas concentration is  $1 \times 10^{20}$  atoms/cm<sup>3</sup> or higher (Col.10, line:65).

However, Ichijo et al (6821828) fails to explicitly teach Applicant's amended claim limitation wherein the sputtering occurs as a result of a magnetic field generated on a target by a magnet.

Art Unit: 2813

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Ichijo's teachings to include sputtering using a magnetic field generated by a magnet on a target because such a technique is well known in the semiconductor arts – sputtering itself is using a magnetic field to bombard charged particles against a target and magnets are commonly employed.

18. A method for fabricating a thin film transistor according to claim 1, wherein the second amorphous semiconductor film is removed by dry etching using hydrazine or tetramethyl ammonium hydroxide (Col.12, lines: 10-20).

20. A method for fabricating a thin film transistor according to claim 3, wherein the second amorphous semiconductor film is removed by dry etching using hydrazine or tetramethyl ammonium hydroxide (Col.12, lines: 10-20).

27. A method for fabricating a thin film transistor according to claim 1, wherein the noble gas element is one element or more elements selected from a group' consisting of helium (He), neon (Ne), argon (Ar), krypton (Kr), and xenon (Xe) (Col.10, lines: 55-60).

29. A method for fabricating a thin film transistor according to claim 3, wherein the noble gas element is one element or more elements selected from a group' consisting of helium (He), neon (Ne), argon (Ar), krypton (Kr), and xenon (Xe) (Col.10, lines: 55-60).

Art Unit: 2813

36. A method for fabricating a thin film transistor according to claim 1, wherein the metal element is one element or more elements selected from a group consisting of iron (Fe), nickel (Ni), cobalt (Co), ruthenium (Ru), rhodium (Rh), palladium (Pd), osmium (Os), iridium (Ir), platinum (Pt), copper (Cu), and gold (Au) (Col.9, lines: 20-25).

38. A method for fabricating a thin film transistor according to claim 3, wherein the metal element is one element or more elements selected from a group consisting of iron (Fe), nickel (Ni), cobalt (Co), ruthenium (Ru), rhodium (Rh), palladium (Pd), osmium (Os), iridium (Ir), platinum (Pt), copper (Cu), and gold (Au) (Col.9, lines: 20-25).

### ***Response to Arguments***

Applicant's arguments with respect to claims 1 and 3 have been considered but are moot in view of the new ground(s) of rejection.

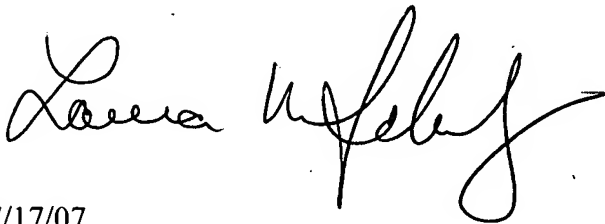
### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Laura M. Schillinger whose telephone number is (571) 272-1697. The examiner can normally be reached on M-T, R-F 7:00-5:00.

Art Unit: 2813

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl W. Whitehead, Jr. can be reached on (571) 272-1702. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'Laura M Schillinger', with a stylized, flowing script.

Laura M Schillinger  
Primary Examiner  
Art Unit 2813

07/17/07